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Supply Chain Management in Fast Fashion

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The global textiles, apparel and luxury goods market had total revenue of $3,049.5 billion in 2011, representing a compound annual growth rate (CAGR) of 3.7% for the period 2007-2011 (marketresearchers.com). Clothing is one of the main products that people need and have to buy. Modern labels, however, introduced innovative way for consumers to shop and distinguish themselves. The phenomenon of fast fashion is relatively new, and quite frequently researchers neglect its individuality, and as a consequence bypass taking notice of its unique qualities and implications of those. This study aims to fill this gap and assemble a theoretical base, while introducing fresh ideas and unconventional viewpoints, supplemented by relevant examples from real brands in the business.

Keywords	Fast fashion, supply chain management, supply chain design, sustainable competitive advantage, time-based competition, information and communication technology

Contents

1 Introduction

Logistics and supply chain management (SCM) as disciplines came to the business world relatively recently, and therefore today they draw a lot of attention. Although sometimes these two concepts are used interchangeably, it is important to differentiate between them. The former appeared first in the 1980s and describes operations within the company focusing on materials management and distribution. The latter emerged only in the 1990s and therefore has a broader view, i.e. adopts the “extended enterprise” perspective, where the presence of other firms, who collaborate in order to bring the product to the final customer, is acknowledged. The supply chain represents a network of raw materials and components suppliers, manufacturing plants, warehouses and distribution centers, stores, and end users. For a long period of time companies had been directing their efforts to concentrate on individual business functions, but then they started to switch to business process integration among all the links of the supply chain. SCM, thus, strives to enable an efficient flow of right products to the right places at the right time in order to create additional value for customers whilst minimizing costs. It aims for integration within the supply chain.

Fast fashion (FF) shares the same objectives, making the best use of SCM. Brands like Topshop, H&M, and Zara capitalize on their ability to spot market opportunity promptly and deliver products at the right time, at the right place and at the right price. However, with its high volatility of demand and increased product variety, FF represents a significant challenge for existing SCM techniques. FF brands generally offer clothes at much lower prices than luxury or mass-luxury brands, and that has to be taken into consideration too when designing a supply chain in order to minimize costs where possible and bring these savings to consumers. Brand rivalry is quite tight in this industry, and as the environment of the fashion world is certainly not stagnant, companies have to constantly find new grounds to compete, which are often found in sustainable SCM. Consequently, successful supply chain network design and management is at the core of operative competitive strategies. This study aims at researching the aspects that are influenced the most under the business model in question and bear the biggest potential in the process of adding customer value.

1.1 Objective and scope of the research

The majority of authors, such as Fernie and Sparks (2009), choose to refer to FF as a form or even a synonym of Quick Response (QR), which is a distinctive SCM technique used in apparel and textile industry. Only a few differentiate between the two concepts; among others are Cheng & Choi (2010) who use the term Global Quick Response which is, essentially, an equivalent of FF, accentuating its international scope, and Nakhata (2008), who acknowledges dissimilar premises for the development of the two methods.

This study intends to support the notion of FF being a separate concept and to explore its roots and clarify its goals, ultimately explaining what exactly FF is and what elements it relies on. It also tries to prove that, contrary to popular belief, which probably arises from the rapid pace of the industry, FF has more to it than just time-based competition. And last, but not least, the study aims to research how SCM approach varies depending on the size of the company, since the market embraces not merely large enterprises like Topshop, H&M, Primark, etc., but very small brands too, e.g. Gina Tricot and Monki.

1.2 Research Methodology

1.2.1 Secondary research

The research is qualitative in nature. Secondary research was conducted with the help of literature, which, first of all, included books that generally discuss SCM topics, occasionally referring to textile and apparel or fashion industries. Still, in order to gain a deeper insight into the particular branch in question, namely FF, a number of articles had to be collected. In addition, both types of sources provided recent information on real company cases that were relative to the topic. Company cases that have been derived from secondary research present large businesses, specifically Swedish H&M with more than 2.5 thousand stores, Spanish Zara of Inditex with over 1.5 thousand stores, and Mango with around 2 thousand stores, Italian United Colors of Benetton, and smaller ones, such as American Apparel from the U.S. with over 250 stores and Gina Tricot from Sweden with more than 150 stores.

1.2.2 Primary research

Primary research was conducted in form of a structured interview, questions to which may be found in Appendix 1. Monki was selected as a practical case study. The interview took place in October 2012, and involved company's design team. Since it is a small company, and there is plenty of interaction between the departments, the design team was able to answer all the questions relating to SCM and IT while keeping the marketing perspective of the topic. Chapter 6 presents the outcomes of this interview.

As previously mentioned in Section 1.1, FF market is not exclusive to large brands, and there are plenty of small-sized players. However, it is nearly impossible to obtain extensive information on the latter through secondary sources. That is why in this study it was chosen to take a look into real-life SCM operations of a small, yet rapidly developing FF brand, since without any doubt, their SCM approach is quite different from the one used by bigger enterprises.

2 Nature of Fashion Markets

In order for this research to be conducted, a clear framework must be built first that will help in distinguishing FF from its counterparts.

The fashion industry has two main currents: *haute couture* - exclusive designer fashion that caters to extremely wealthy clients delivering unique items sewn out of superb fabrics, thus putting more emphasis on service as opposed to product - and *prêt-à-porter* - ready-to-wear (RTW) fashion which offers affordable apparel mass-produced at factories using standard sizes that apply to the majority of people. The latter can be divided into the following segments (Cheng & Choi 2010: 389; Hines & Bruce 2007: 55):

- Premium (represented by Dior, Chanel, Louis Vuitton, Prada, Versace, etc)
  Practically every fashion *maison* that was established as *"haute couture"* now issues RTW collections which make up the biggest part of their revenue. Such items cost less than *haute-couture*, but are still high-end. This is the very birthplace of trends that are consequently passed on to the mainstream fashion.

- High street, further fractioned into mid-market (represented by Zara, Topshop, United Colors of Benetton, etc.) and down-market (represented by New Yorker, Primark, Forever 21 etc.)
  Such clothes and accessories follow trends brought by the major catwalks but sell at favourable prices. This is possible due an array of facts, such as inferior quality of materials, lower production costs, minimum customer service, etc.

- Supermarket
  This includes brands created by supermarkets to serve the needs of low-income consumers who are not particularly fashion-conscious.

The criterion adopted for segmentation is a customer's attitude towards the product. Garments made by premium brands are perceived as affordable, although still exclusive, luxury; high street fashion is much less expensive, but still offers hip styles for masses; and finally, clothes sold at supermarkets are often referred to by fashion-conscious buyers as "cheap" and "un-trendy". Figure 1 pictures those segments arranged in a pyramid according to product price levels, degree of design involvement, and production volumes.

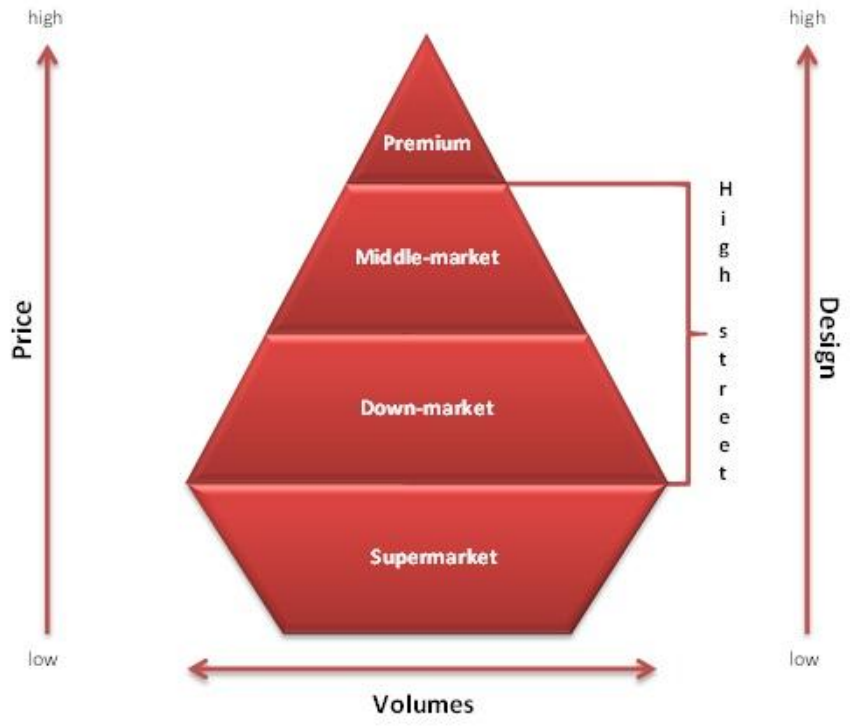

Figure 1. Market segments in RTW apparel industry.

From such perspective the business model in question can be distinctly seen at its full potential in the high-street segment. It should be recognised that brands that comprise it have several lines, most common being evening dress, business attire, sports clothes, casuals, knitwear, denim, undergarments, and outerwear, not to mention a wide range of accessories such as shoes, bags, jewellery, eyewear, hats, scarves, gloves, hosiery, and in some cases even cosmetics. Obviously not all merchandise is fashion-sensitive. Each of the lines listed above would have durable and transient pieces. This study explores how companies combine their managerial approaches in handling both product categories.

Hines and Bruce (2007: 44) describe the phenomenon of FF as "…a construct that describes and explains retailer desires to satisfy consumer demand more efficiently and effectively. Efficient in the sense that time is reduced. Effective meaning that fashionable items are in store to meet demand." This means that FF brands strive to quickly adjust to changes in consumer demand that derive from what people see in magazines and blogs, on the runways of world fashion capitals or even in movies and television shows, and to adapt them into fashion-forward products that are to be delivered to the customer in the shortest time possible.

This rush is easily explained by the shortened product life cycles (PLC) in fashion industry. There are generally two major seasons: Autumn/Winter and Spring/Summer. To fill the gaps between those, some RTW brands have recently introduced resort, or cruise, and pre-fall collections. However, following the will to maximise profits, FF took it to a whole new level, breaking the cycle of seasonal changes into very brief retailing periods and presenting new items once or even twice a fortnight expanding product variety, which in turn affects PLC as newcomers in current collection cannibalise already existing pieces to some extent, thus resulting in even shorter shelf life with some products barely even reaching maturity stage. Topshop and Zara have up-to-date products arriving in their physical and online shops every week whereas H&M and Vero Moda update their range daily.

Time race demands reduction of lead times throughout the whole supply chain. Christopher, Lowson and Peck (Fernie & Sparks 2009: 104) state that cumulative lead time has three dimensions: time-to-market needed to recognise and render market opportunity, time-to-serve needed to manufacture and deliver a product, and time-to-react needed to adjust to changes in demand. All of these should be slashed as much as

possible. Clearly, these cuts forcefully quicken the pace of the industry and as a consequence do not allow much space for long-term planning. For that reason brands must reduce their reliance on forecasts and improve their flexibility.

According to Kotler and Armstrong (2008: 204), there are two basic sources of competitive advantage: cost and differentiation. It comes as no surprise that in FF time differentiation is a prerequisite rather than an ultimate source of sustainable competitive advantage (SCA), which must be complimented by aspiration for cost leadership or other types of differentiation. Value brands like Forever21 have selected cost/time combination, targeting young demographic with relatively low disposable income. Zara, on the contrary, epitomises creativity and individuality. It has broken so far away from other FF brands that even the pickiest elite fashionistas do not find it disgraceful anymore to demonstrate their Zara pieces publicly at major social events, and by doing so they acknowledge this Spanish brand as an equal to premium ones rather than just as a manufacturer of high fashion designs' downscale versions. Curiously enough, H&M is left hanging in-between. It is still perceived by many as a value retailer, owing to the firm's continuous low-price policy before, the situation that the management is striving to correct at the moment. Already this year H&M customers may find jumpers for as much as 60 EUR, and in spring 2013 H&M luxury label will be launched.

Fashion homogenisation (Fernie & Sparks 2009), caused by limited variety of trends, common pool of inspiration, and imitation, leaves little space for discrete product designs, especially seeing that it is difficult to justify intellectual property on intangible assets, and in the fashion world one practically cannot protect its product from copycats. Thus, very often, when it comes to the latest designs that have just been demonstrated by major fashion houses, the brand which supplies look-alike the quickest usually wins the race. Naturally, some brands have developed their own style different from that of competitors, and as a result, a Louis Vuitton blouse may be interpreted in multiple divergent ways to fit different brands' distinctive personalities (for instance, "indie" Topshop or "smart" Zara). Celebrity advertising can give a temporary boost in sales (Lana Del Ray for H&M, Reese Witherspoon for Lindex), but inviting celebrities to be a brand's face for an extended period of time can have a positive effect on a company's corporate identity and subsequently SCA (Gisele Bündchen for Esprit, Kate Moss for Mango, Alexa Chung for Vero Moda). The same goes for designer collaborations with Lindex's one-off Missoni capsule collection and H&M constantly teaming up with industry giants like Karl Lagerfeld, Versace, Jimmy Choo and so on, raising its

image in customer's eyes and paving the way for British Vogue issuing a supplement for its May 2011 issue which was created in association with the Swedish brand.

Such gambling environment makes FF companies to look for new ways to create customer value. Their marketing strategies and programmes pertain to their SCM techniques, for a supply chain must be designed to support marketing mix which, as Kotler and Armstrong (2008: 50) suggest, consists of product (the goods offered), price (the amount of money requested by a company for its product), place (activities and channels needed to deliver its product to target customers), and promotion (methods of communicating and promoting a company's marketing offer to customers). If a brand fails to supply the right product, it signals that information flow is not accurate enough. If a brand fails to offer the product at the right price, it signals that supply chain network is not efficient enough. If a brand fails to supply at the right place or time, it signals that channels within the network are not designed correctly and lead times are not being handled properly. Hence, supply chain network, which involves both, physical material flow and communication and information system, must be designed and managed efficaciously based on appropriate strategies and tools, which are explored in the next sections of this study.

3 Supply Chain Philosophies

3.1 Lean

Lean management, sometimes synonymised with Toyota Production System, arose with Japanese automobile industry, where companies were faced with the problem of waste (*muda*). This model is built upon cost optimization that is reached by understanding customer values and eliminating all types of non-value added steps along the value stream defined by Kerber and Dreckshage (2011: 7) as "all of the activities, both value added and non-value added, to go from raw material to finished product". Value-added activities are what customers are willing to pay for, whilst the rest only consume resources and add cost. Lean management introduces seven forms of waste (Ohno 1998: 19):

1. Overproduction: manufacturing more than is currently required

2. Time on hand: idle time spent waiting in queue in anticipation of further steps in processing
3. Transportation: unnecessary movement of goods that adds cost and leads to product deterioration and damage
4. Processing itself: performing more tasks than what a process requires, although simpler operations would suffice
5. Stock at hand: maintaining excess inventory that consists of raw materials, work-in-progress (WIP), and finished goods that take up floor space and require additional handling
6. Movement: unrequired human and technology motion
7. Making defective products: wasted effort that does not conform to specifications and thus has to be discarded

Lean thinking led to development of techniques that would help to eliminate waste, the most prominent among those being Just-In-Time (JIT). The objective of this system is to eliminate WIP in the value stream and have parts needed for the next process arrived right when they are needed ensuring a smooth operation flow. Figure 2 shows a typical manufacturing operation and illustrates how much wastefulness there is customers have to pay for, when alternatively it could be eradicated.

Figure 2. Value stream for a typical manufacturing operation (Jones & Robinson 2012: 391).

3.2 Agile

On the other hand, agile supply chain is targeted at service optimization. It is market-driven, meaning that it is highly responsive to prevailing customer demand, and dynamic, denoting its continuous adjustment to external alterations. Agility is demonstrated in the ability to reconfigure all the various facets of the supply chain at any given moment in accordance with up-to-the-minute consumer preferences. Information should consequently be collected as close to the customer as possible and then passed on to other parts of the value stream. Yet information sharing is realised in a non-traditional way. Figure 3 demonstrates how, compared to a conventional linear system, where information is received by each supply chain member from a preceding level, information in agile constructions aggregates as it travels from end customers along the supply chain, thus minimizing the bullwhip effect, which occurs when information about demand is distorted as it moves back through a multi-echelon supply chain, and this lack of actual data takes the form of safety stock causing unnecessary inventory accumulate like a snowball. In addition to information lag, other major reasons for this problem are long lead times, uncertainty in demand, and complicated supply chain structure.

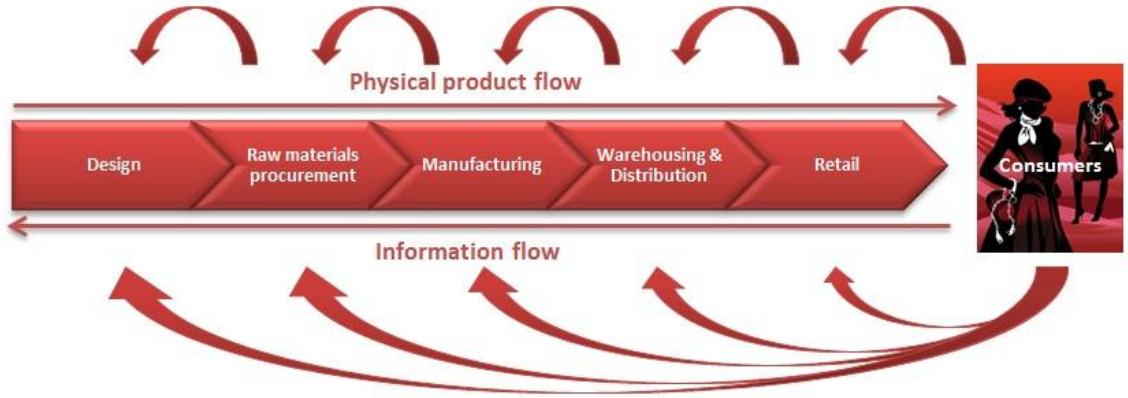

Figure 3. Comparison of Information flow in a traditional linear system (arrows above) and in an agile system (arrows below).

According to Christopher, Lowson and Peck (2004) there are four characteristics to an agile supply chain in fashion industry (Figure 4).

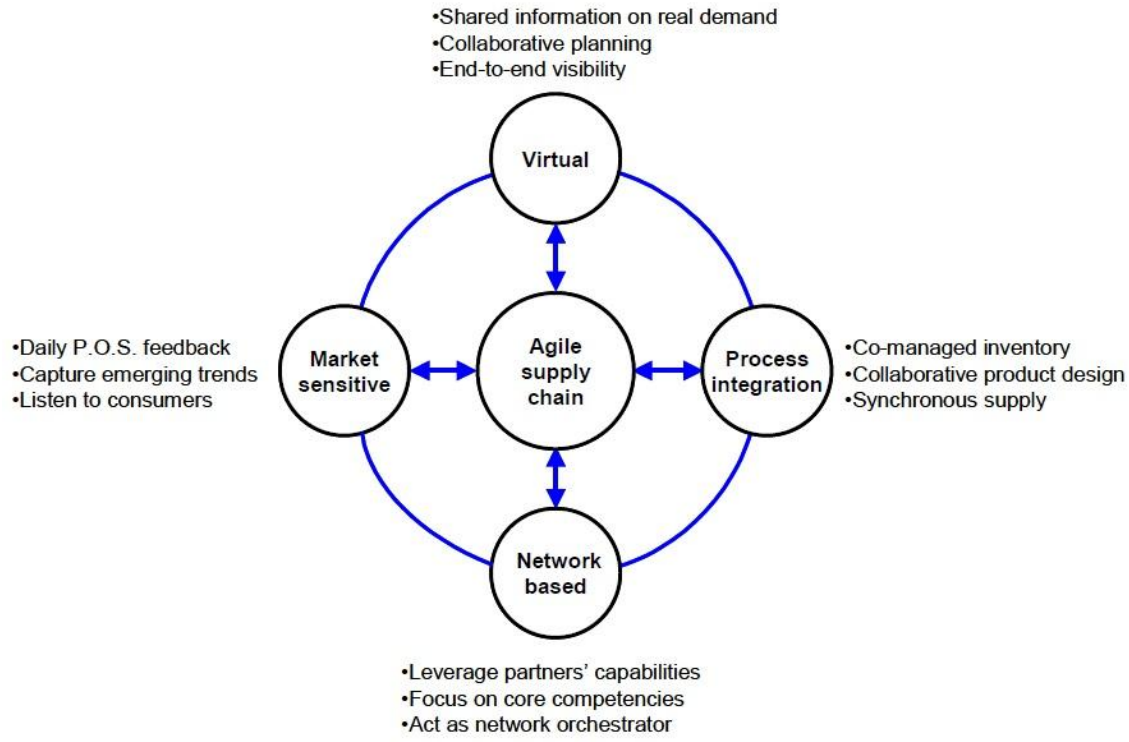

Figure 4. The foundations for agility in a fashion business (Christopher et al. 2004).

To sum up, agile philosophy implies its reliance on real demand instead of forecasts as a result of being information based rather than inventory based. Supply chain transforms into supply network where relationships between organizations tend to be close and inter-dependent. Separate functions are integrated into processes, which are in turn aligned vertically among partners and horizontally within a single organization to ensure unobstructed functioning of the whole system (Nakhata 2008: 42). Process alignment is achieved through cooperation and shared information (Christopher 2011)

Just like lean philosophy and JIT, agile philosophy utilises its own methods too. Efficient consumer response (ECR) was designed specifically for grocery industry, while Quick response (QR), examined in detail in Section 4.1, emerged to address textile and apparel industry.

3.3 Which approach to choose?

Mason-Jones, Naylor and Towill (cited in Farahani, Rezapour & Kardar 2011: 63) present readers with a curious perspective of differentiating between agile and lean logistics philosophies. They introduce the terms “market qualifier” and “market winner”, the

former encompassing the characteristics of the market that are needed to be taken into consideration in order to enter the competition, and the latter being the one characteristic, possession of which leads to surpassing the competition. Table 1 suggests that lean philosophy should be adopted when the winning determinant is cost, and agile – when it is service level. Overall, lean approach concentrates on eliminating waste in form of inventory and moving towards just-in-time systems that struggle to reduce unproductive time in the pipeline, whereas agile SCM is driven by the will to accurately match supply with demand and the ability to reconfigure the pipeline in a blink of an eye.

Table 1. Market qualifier and market winner for agile and lean supply (Mason-Jones et al. in Faragani et al. 2011: 63).

	Market Qualifiers	**Market Winners**
Lean Supply	Quality Lead time Service level	Cost
Agile Supply	Quality Cost Lead time	Service level

It is generally acknowledged that agility is a Holy Grail for fashion industry. Nonetheless, this statement leads to misconception that fashion brands completely forget about lean supply, which is not true at all. That is why it is safe to say that FF supply chains tend to combine both lean and agile approaches. There are many options for doing it. Christopher (2011: 100) compares appropriateness of agility and leanness on the basis of variability and volume of a company's products, coming to a conclusion that agility is suited best where product variability is high and volumes are low, which is true for the ephemeral seasonal collections with the shortest PLC, whilst leanness with its low variability and high volume is exactly what portrays basic collections where demand is more predictable and customers are less sophisticated (Figure 5). FF interprets this notion via mixed supply based discussed in further detail in Section 4.2.

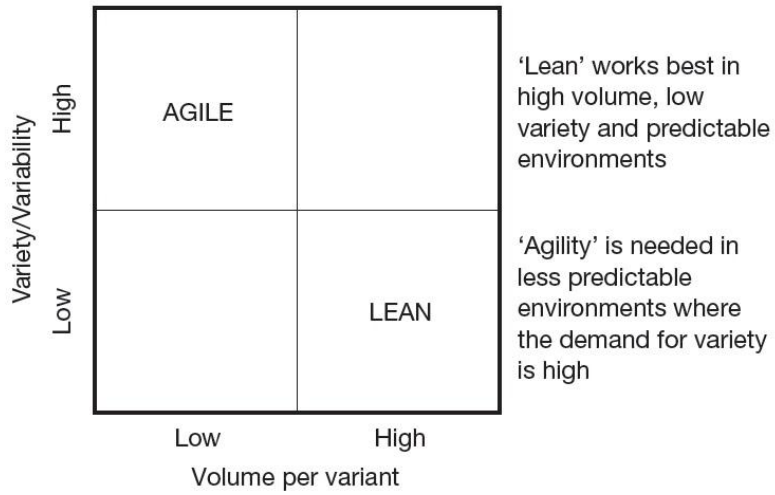

Figure 5. Agile or lean? (Christopher 2011: 100).

Another example would be the postponement strategy. This concept denotes putting off product configuration until the exact market demand is known thus reducing risks and costs associated with carrying stock. (Cheng & Choi 2010: 52) It is linked to another term, namely decoupling point, which symbolises strategic inventory that is kept between downstream and upstream flows (Figure 7).

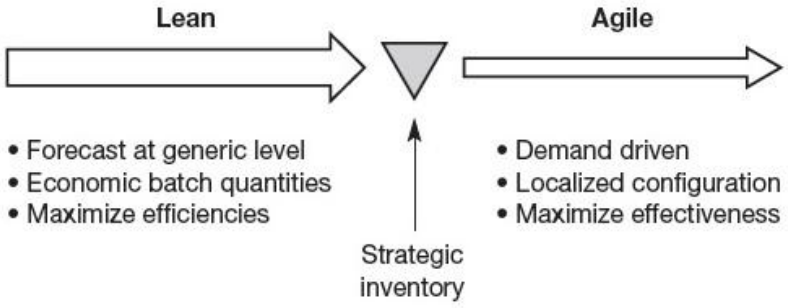

Figure 6. The decoupling point (Christopher 2010: 102).

The optimum decoupling point would be right at the intersection of order-based P-time (production time, or the time it takes for a product to go through the whole logistics pipeline that comprises source, manufacture and deliver lead times) and forecast-driven D-time (demand time, or the time that customers are willing to wait for their order to be fulfilled). These two times and the relationship between those are depicted in Figure 8.

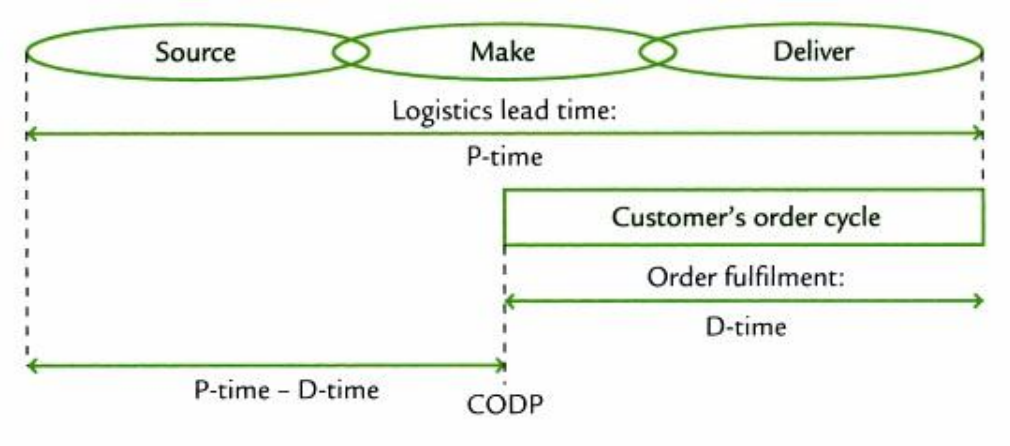

Figure 7. P-time, D-time and the relationship between them (Harrison and van Hoek 2008: 151).

Benetton found a way to implement this strategy by producing “grey”, or uncoloured pieces of clothing, and postponing dyeing until the garment was completely finished, which allowed the product to more accurately reflect current fashion trends.

4 Supply Chain Strategies

4.1 Quick Response

QR has its roots in the mid-1980s U.S. as American textile and apparel enterprises were being pressured by foreign low-cost manufacturers. A onsulting firm Kurt Salmon Associates was drawn to develop a programme that would protect domestic industry from imports. Their new-found solution, QR, was intended to bring local production and retailing closer to each other by means of modern technology. The objective was to reduce lead times and inventories by improving forecasting and flexibility. In other words, to design an impetus for the “virtuous circle” (Figure 9). Taking surplus time and inventory out of the cycle leads to overall cost reduction that improved U.S. textile and apparel manufacturers’ competitiveness (Rushton 2006: 229). Naturally, the initial investment of implementing QR is quite high due to expensive technology that QR relies on. Nevertheless, it will be justified as soon as the strategy is firmly established and running, for keeping inventory is much more expensive in the long run. “You have to spend money to save money”, so to speak.

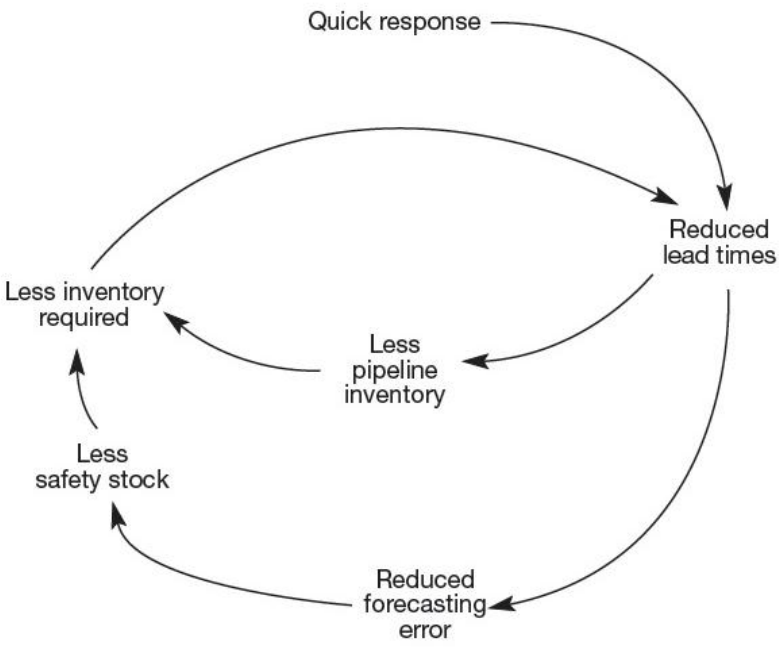

Figure 8. Quick Response system may trigger a "virtuous circle" in logistics (Christopher 2011: 152).

In general, QR aims at better understanding of customer wants, namely what designs they anticipate, how long they are prepared to wait and what price they are willing to pay for the combination of the resultant accurate product and speedy service. This is a classic “pull” philosophy where end consumer sets off supply chain activity as opposed to “push” philosophy where everything is made in anticipation. QR strives to enhance information flow in the supply network facilitating industry-wide cooperation. Both of these notions will be now examined below in Section 4.1.1 and Section 4.1.2 respectively.

4.1.1 Value of information

Yücesan says that “information is said to be the glue that holds the supply chain together” (Jung, Chen & Jeong 2007: 134). By being a basis for decisions, information flow also initiates material flow and planning. In the most primitive context, if designers follow the news of the fashion world and the latest culture fads, they can anticipate what customers will most likely want, if retailers observe what customers buy, they will know what merchandise to stock, and when this data is transmitted to manufacturers, they can improve product availability by planning their sourcing, production and scheduling more effectively,

The fundamental tenet for superior customer responsiveness is end-to-end visibility in the supply chain. As a rule, inventory hinders supply chain members from hearing the voice of the market and takes away the flexibility factor. So, inventory levels must be held low to avoid obsolescence caused by overstocking, but at the same time minimise stock-outs, that is when a product style, colour or size desired by a customer is unavailable at the store for it has been sold out (U.S. Congress 1987: 23). QR is a classic case of substituting information for inventory. In addition, the transparency makes it possible to synchronise activities among network participants so that they "march to the same drumbeat" which is ultimate consumer demand (Christopher 2011: 112).

Clearly, it is not enough to simply collect information. It must be analysed and shared to become useful. For all these functions information and communication technology (ICT) proves irreplaceable (Harrison, Christopher & Van Hoek cited in Hines & Bruce 2007: 60). This concept combines comprises hardware and software used for decision support, operation planning and execution, and communication between companies and individuals. These are explored in depth in Chapter 5. Christopher (2011: 265) believes that together with process alignment, "information sharing provides a powerful platform on which to build collaborative working relationships across the supply chain".

4.1.2 Value of relationships

Paradoxically, relationships built on trust are needed for companies to be able to share information with each other and collaborate (Bowersox, Closs & Cooper 2010: 379). So it can be said, that relationships and communication are two inter-dependent concepts that go side by side and amplify one another. A firm's devotion is evident when information that is being disclosed to partners is not purely operational such as sales data, but strategic as well, e.g. product development. Jones and Robinson (2012: 119) look at degrees of commitment starting from conventional buyer/supplier relationship (solely commercial, without any involvement whatsoever) to associated relationship (long term, when supplier gives certain guarantees, still is limited by contract) to partnership (fully co-operative, tactical). It's habitual for firms to manage a portfolio of suppliers, some of which are selected for one-off transactions on the basis of low cost in cases when additional dash in volume or differentiation is needed and others are labelled "key suppliers" with whom core organisation is engaged in a long-term relationship on the premise of common goals and gaming policies. Yet there is an issue of unequal distri-

bution of power that has to be taken into consideration. Stronger businesses can exert leverage in their own tactical interests on smaller suppliers who are held “hostages”, for example pressure them into producing bigger volumes or delivering goods faster (Fernie & Sparks 2009: 91).

In chase for network simplification, many companies are narrowing down their number of suppliers (Harding quoted in U.S. Congress 1987: 23). This allows them to become closer to key partners and improve network visibility since it is no longer dispersed around a multitude of contractors. In 2011 H&M reported that it worked with 747 suppliers, with 150 of those being long term strategic partners. The brand placed 58% of all orders with these key suppliers. This manifests tendency for virtual integration: stage of collaboration when, thanks to shared intelligence, boundaries between different players in a network are blurred to ensure their seamless and synchronised operation as a single entity.

Bearing the same idea in mind, large enterprises sometimes make their moves towards vertical integration, or ownership of assets up (backward) or down (forward) the supply chain. The case of Zara exhibits determination to keep tight control over production processes. The brand’s parent company Inditex owns a wide array of resources which are shared by Inditex’s brands. Zara’s manages design, pattern-making, cutting, warehousing, distribution, and logistics itself. About 40 per cent of fabrics used by Zara come from parent company’s sourcing or textile production and finishing subsidiaries. Zara outsources sewing, whilst its own factories are responsible for pressing, tagging, and final inspection of completed garments. This obviously facilitates greater control of all processes, but still is very challenging due to high cost of owning and maintaining such a gigantic enterprise. Furthermore, because of extended field of activities that have to be managed centrally the whole scheme may backfire and result in slow response (Cheng & Choi 2010: 50).

That is why nowadays firms incline to focus on their core competencies and outsource other operations from smaller companies. This is the case with outsourced sewing in Zara mentioned earlier. Another example of such division of labour would be Benetton that keeps the capital-intensive parts of the operation ‘in-house’, contracting out to SMEs the labour-intensive phase of production like tailoring, knitting and ironing (Fernie & Sparks 2009: 41). So, it is advisable for businesses to mix and match their buy-

er/supplier portfolio and types of ties with those in order to reach ideal level of flexibility (Cheng & Choi 2010: 50).

4.2 Fast fashion

FF is a business model that developed from QR. The similarities include, for instance, high product velocity, dependence on information, integration in supply chains, and extensive use of ICT.

There are nonetheless several fundamental differences that separate the two theories. The marketing-based ideology of FF encourages consumers to shop regularly and make buying decisions fast (Hines & Bruce 2007: 44). This is achieved via wider product variety offer compared to regular clothing retailers, and pre-set numbers for orders from factories, meaning that each model is usually brought out only once in relatively small quantities and if it sold out, it will not be replenished from production plant (Hines & Bruce 2007: 44). Feedback from stores is therefore used not to correct situation with existing articles at the store but rather to form a perspective of the real demand, detect opportunities and quickly introduce new products at their peak. Clearly, merchandise turnover is much quicker in FF than in QR. Inventory holding is not a suitable solution here because of short PLC and the ensuing risk of obsolescence. So, the less intermediate points there are to slow down product movement, the better. Following these guidelines, many companies try to eliminate stages in their distribution systems. For example, Gina Tricot distributes its garments to stores directly from the factory.

Another crucial aspect stems from globalization. QR was directed at combating foreign invasion, whereas FF does not have such political facet. Quite the contrary, FF takes full advantage of global markets in terms of sourcing, manufacturing, and retailing. Companies are constantly expanding and entering new markets, while simultaneously consolidating their operations in new areas building distribution centres, factories, and offices there. FF is also characterised by its unique struggle to strike a balance between domestic production and global procurement in order to combine lean and agile approaches mentioned in Section 3.3. Basic items that are sold all year long with minimum seasonal amendments are viewed as a routine operations environment, and are produced at factories located in low-wage countries. Conversely, production of fashion-sensitive items is normally kept close to home addressing the need for rapid response to real-time market conditions; this way the newest trends can be converted into fin-

ished product stat. Considering short PLC of fashion goods, it is not viable to ship them from overseas as it would take too long to transport them by sea, and it would be too expensive to carry them by air.

It is apparent that FF does not necessarily try to keep costs down, but sometimes even intentionally resorts to more expensive solutions. The main objective of supply chain design for such brands is to find the middle ground between cost and service; yet the optimum point is determined solely by company's individual strategy.

5 Information and Communication Technology

In the era of rapid development in ICT, companies face increasing need to coordinate their activities in supply chains. In addition to heavily automated operations at production plants and distribution centers, as it is the case with Benetton and Mango, new technological solutions have provided businesses with completely new ways for transactions handling and information sharing. They enable visibility of product demand and stock levels through the full length of the pipeline. Without them, such things as instantaneous data transition and e-commerce simply could not exist. Shi and Chan state that "IT is an important enabler for the achievement of SCM effectiveness and efficiency" (Waters 2006: 177). Simchi-Levi, Kaminsky and Simchi-Levi (2009) refer to SCM system components as "capabilities required to achieve supply chain excellence". The main fields that ICT is supposed to benefit are information collection, data access and analysis, and interaction among supply chain partners. To accommodate all these needs, a wide array of modules exist which can be classified into four categories based on their functionality (Bowersox et al. 2010: 98):

- Communication systems to facilitate information flow between functional areas within the company and between the links of the supply chain;
- Execution systems to support logistics operations such as warehousing and transporting goods;
- Planning systems which can generally be subdivided into strategic planning systems that focus on long-term issues and tactical planning systems that focus on short-term, operational issues.

Accordingly, the number of modules required to build a comprehensive information system in most cases tends to be substantial. Obviously, it is impossible to describe each one of them in this study, and that is why only the most essential technology that drives FF industry will be presented.

5.1 ERP

Enterprise Resource Planning (ERP) is the next step from legacy systems which joins stand-alone software modules together to form a single structure that enables visibility across the entire supply chain, from the design process to the store shelf. ERP can be visualised as a backbone for supply chain's information system to which some or all functional parts are connected. Its core is a central database into which information is fed to be stored and extracted for processing realised by various applications. Common modules include production planning, purchasing, inventory, marketing and sales, accounting, and human resources. Many ERP vendors are developing specialised solutions to address requirements of different industries.

In 2002 Benetton made a decision to move from its old legacy systems and chose SAP Apparel and Footwear Solution (AFS) to improve its planning, sourcing, distribution, and replenishment processes. The new ERP solution was installed in Benetton's production plants, logistics centres and business facilities. (SAP AG: 2002). There are three features that make SAP AFS different from a generic ERP system; these are grids, categories, and season-based scheduling. All of them are aimed at organizing and mapping articles, which helps the software to cope with large volumes of data and manage endless product characteristics and combinations that fashion industry is infamous for.

Grids are three-dimensional structures used to distinguish materials based on criteria previously assigned to each one of them (e.g. size, colour, and neckline). By combining those variables, users create a unique grid value for each article. Categories take the process of ordering the materials even further by allowing users to segment grid values by quality levels, customer segments, and countries of origin. Categories are different from grid values in that they can change throughout the logistics process, whereas grid values are constant from the moment they are assigned to a material. Production scheduling in SAP AFS adopts a seasonal framework, where users can define seasons and even collections inside of those and themes within collections. Products can also

be categorised by their relevance to a season, so if a specific seasonal characteristic is assigned to a material, it will be added to production schedule only for a pre-defined period of time.

5.2 CAD/CAM and PLM

Computer-aided design (CAD) and computer-aided manufacturing (CAM) refer to software and hardware tools which assist in realizing designers' ideas into finished products. CAD is not just an alternative for traditional pencil-and-paper sketching that helps designers with concept generation. After the initial drawing is finished, designers can play with colours and fabrics and even create a 3D prototype using custom-input measurements to visualise how it will look on an actual person and test scalability by changing mannequin's body types, which helps to reduce fittings. Moreover, users can save templates that may be accessed later for re-introduction of that particular piece, or they may even be transformed into a completely new style. This noticeably speeds up the creation stage. Finally, the application disassembles sketches into patterns that are transferred to CAM programme in order to be used at the plant for mass-production. By controlling production machines, CAM automates manufacturing process, replacing repetitive labour-intensive tasks such as cutting, sewing and dyeing.

In 2006 Mango signed a contract with Lectra, a leading provider of fashion-specific technology, for its web-centric product lifecycle management (PLM) solution which incorporates CAD/CAM technology. PLM solutions integrate disconnected CAD/CAM modules into one system thus enabling seamless development and production process through collaborative work of all participants in the value chain on an enterprise level. Lectra's PLM offering includes applications that, in addition to product design, development, and manufacturing, assist in defining collections, evaluating potential sales, scheduling, optimizing sourcing, managing workflow, finding the right balance between cost and quality, and of course monitoring performance.

5.3 PoS

Point-of-Sale (PoS) systems were created streamline inventory management and transaction handling with customers and vendors (or company's offices, factories, and distribution centres in case stores are owned by the brand). In addition to speeding

checkout, they keep track of what retailer has stock, what it needs to order and what is selling well. Typical PoS hardware includes computers, touchscreens, bar code scanners or RFID scanners, card readers and PIN-pads, cash drawers, and receipt printers. A PoS solution also includes specially designed software to store and analyse information, with built-in customer loyalty features like gift cards, coupons and customer bonuses.

Some companies, for instance Zara, use personal digital assistants (PDA) - handheld computers which facilitate fast information input, such as on-the-spot customer feedback received by asking questions like “Did it fit?” or “Do you like the colour?” after a client has tried on an item in fitting room, and transmit it via network to the main PoS system in a flash. After being analysed, this data is displayed side by side with actual sales information, and this helps in understanding consumers by showing not only plain facts, but customer perceptions too. All these elements are crucial in gaining customer insight which will be later used in future collection development.

In 2009 H&M signed an extension to its 100 million EUR global installation, maintenance and consultancy service agreement with its partner of over 20 years Fujitsu to deliver its PoS TP-X platform to the retailer’s stores all around the globe together with replacing surrounding scanners, displays and printers.

5.4 EPC/RFID

Radio-frequency identification (RFID) is a method for identifying and tracking merchandise throughout the supply chain. Electronic product code (EPC) is an application that maximizes RFID technology by making it possible to assign specific information for each item. Unlike regular bar coding, usage of EPC permits assignment of specific unique information to a particular merchandise article, i.e. not only information about company and shirt model, but also a unit-specific information that makes it possible to differentiate between two similar shirts, which facilitates inventory management process remarkably. A label with an electronic chip that contains EPC can be attached to a single piece of clothing, a case or a whole pallet. Active chips have a battery in them and emit information independently, while passive chips, for example the ones incorporated in EPC labels, only store information that can be read by RFID scanners. The difference between RFID and bar codes is in that bar codes may only be scanned when they are being directed at by scanners, while RFID has a greater reach and

scanners can receive information even if the item is far away or behind a hindrance. It is possible to attach RFID tags to a fabric before the production takes place, and later they will be transferred to a finished garment thus enabling product visibility along the entire process of manufacturing, distribution and retailing.

American Apparel has implemented RFID technology in more than 100 of its 285 stores, and this number is expected increase by the end of 2012. The company uses AD-222 EPC-compliant RFID tags from Avery Dennison, handheld MC3190-Z and fixed FX7400 RFID readers from Motorola, and Xterprise's Clarity ARS in-store inventory tracking software which is integrated with the company's overall ERP system.

RFID stations are deposited at 4 key locations. The receiving station is where pre-tagged items from the factory in Los Angeles which is equipped with RFID printers are brought to. The system compares arrived items with the advanced shipment notice and adds them to in-store inventory before they are taken to the storage facility. Employees then use fill station at the back store that says which items need to be taken to the sales floor and lets users to inform it about what they are actually taking. On their way employees pass validation point located somewhere between the storage facility and the sales floor which is a validation point that checks if the amount of items that are being taken to the sales floor match the data at the fill station and if the employees are carrying some other items by accident. Lastly, at PoS terminals RFID tags are scanned to inform the system that the items have been displaced and need to be replenished. Besides, RFID speeds up check-out process, because staff does not have to scan each item's bar code as it used to be before.

Other benefits include reduced manual labour by up to 30 per cent and time spent on checking inventory, since previously employees had to count garments at the sales floor manually; now, thanks to RFID, they simply sweep portable scanners across the racks. Inventory improvements are manifested in its reduction by 15 per cent and 99 per cent accuracy. Most importantly, RFID helps to maximise sales owing to improved control and visibility of stock, giving 14 Per cent sales increase as compared to non-RFID stores. Although American Apparel uses QR strategy and is not exactly a FF type of brand, due to its little dependence on trends or seasons, it is still a good example of a company who operates high product volumes and needs to replenish stock frequently and rapidly (Avery Dennison Corporation: 2012).

5.5 E-Commerce

Nowadays people are too occupied with work, gym, family matters or other activities that do not leave much time for leisurely shopping. Therefore a contemporary retailer has to accommodate their need for time saving by offering their product online. Surely there are other implications for internet retailing. Often companies launch internet-exclusive articles that cannot be found in physical stores, which helps to save wracks for other items to be displayed leading to more efficient utilization of floor space while at the same time supporting viability of web-shops. A company may buy a whole e-commerce solution from vendor and run it themselves; however it is often preferred to resort to either hosting (when a solution purchased by retailer is taken to a company that owns servers and can implement and manage the software providing the retailer with access to it via web) or SaaS which is short for software a service (when retailer rents the solution from a provider who owns the software and the hardware). The latter concept is better explained with the example of Gina Tricot.

In 2012 Gina Tricot decided to change its software infrastructure for purchasing and retail. One of the few things they left untouched was Centiro's e-commerce solution together with Transport Management (TM) solution (Centiro Solutions AB: 2012). It is being delivered as SaaS, which can be explained as a virtual hub platform shared by many "tenants" (companies using the server) who can be connected and interacting or separated from each other by a security barrier. Firms can access the system using either common internet browsers or specialised clients. Centiro manages its servers and covers software support and maintenance. This means that firstly, companies need less dedicated IT staff, and secondly, they do not have to worry about system break downs or software update. SaaS is usually delivered as pay-per-use service with on monthly or yearly fee. Most importantly, SaaS method enables smooth scalability, meaning that as business is growing, it does not have to worry if their system keeps up with increasing information and transaction volumes, because Centiro will boost system capacity itself by simply adding more servers. Basically every solution can be delivered as SaaS, even ERP. Centiro e-commerce allows businesses to keep their clients up to date with the latest information about their online order by sending emails or text notification or updating order status updates in web-shop. The solution also helps to manage returns. Paired with TM, it connects and manages different carriers used for order delivery and helps to control transportation costs.

6 Company Case: Monki

6.1 Background information

Monki AB, who owns apparel brand Monki, was founded in 2005 as a part of FaBric Scandinavien AB from Tranås, Sweden, to join its sister companies Weekday AB and Weekday Brands AB. The first shop opened in 2006 in Göteborg. In 2008 H&M group acquired 60 per cent of shares of the mother company, and the rest of them were purchased in 2010. The total price of the acquisition was 52 million SEK. Although the company is now fully incorporated into H&M Group, the brands were allowed to keep their independence and continue with their visions.

The company continues to expand precipitously. In 2010 the first store outside Europe opened in Hong Kong, and in 2011 a new one launched in the United Kingdom, which proved to be a major success, raising brand awareness around the world. As of 31 August 2012, there are 55 Monki stores in eight countries (Sweden, Finland, Norway, Denmark, Netherlands, Germany, Hong Kong, and the United Kingdom). By the end of 2012 Monki will open their first store on the China followed by Japan and France in 2013.

Monki is not just a simple clothing brand, but also a concept that has a story behind it. Firstly, it differentiates itself in terms of product, because it possesses an individual style which has its roots in Scandinavian minimalism, so exotic for customers from other parts of the world. This means that every fashion trend has to be adapted to fit Monki's character. Secondly, the company has created a unique "quirky" world for its customers, or "Monki friends", as they are referred to, thus selling not only clothes, but a full emotional experience engaging customers with the brand's vision and ideas. The Monki team follows cultural trends and introduces customers to a hip and artistic lifestyle the brand exists in. People are being immersed in the mindset through Monki Magazine and Monki Television which focus on indie music, art and design, traveling, and figures to follow in addition to the latest events in the company's life. This out-of-the-ordinary world comes to life in interior of the stores. So far there are three imaginative designs, each one of them being a set for a different tale: initial motif "The Forgotten Forest", "The City of Oil and Steel", and the latest addition "The Sea of Scallops". This original format is certainly another way of building customer loyalty without having to offer member cards.

6.2 Production cycle

Figure 9 depicts Monki's production process and provides an estimate of lead times involved.

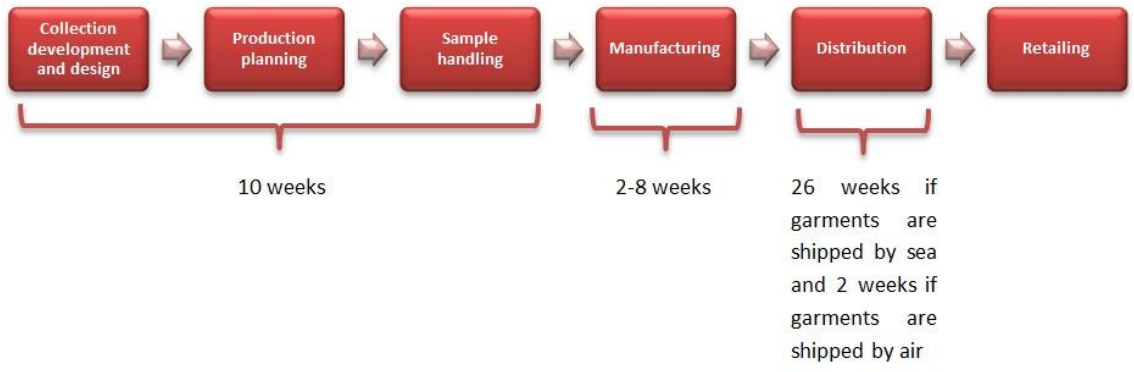

Figure 9. Production cycle at Monki.

Each stage of this value stream is described in more detail in Subsection 6.2.1, Subsection 6.2.2, and Subsection 6.2.3.

6.2.1 Planning

Monki launches two traditional collections per year, Autumn/Winter and Spring/Summer. Within those there are three to five trends, or themes, that bear eccentric names (for instance, "Imagine Me" from October/November 2012). Items in one theme create a wholesome harmonious picture by dint of coordinated silhouettes, colours, and mould. A collection is brought via 11 "drops", or additions that are introduced in batches.

Preparations for the main range start 7 months in advance, whilst the latest trends are accommodated on the go. Sales information from the previous season, combined with innovation, leads way for the planning of the upcoming range. Designers find inspiration from travelling, surfing the internet, following fashion and lifestyle blogs, and reading trend forecasting reports. They capture their ideas in sketches which are sent afterwards, together with measurements and fabric request, to the production office who in turn forwards it to suppliers. When samples arrive, the design team evaluates their

compliance with the design and quality they had in mind and carry out the fitting. After that they comments to suppliers, and soon after alterations are made, samples come back to Sweden again. The process repeats itself three times until garments conform to designers' visions. Finally, production of the collection at factories starts. Textiles are usually sourced after the sketching is complete, and if a project requires specific fabric, its development takes place right before garment manufacturing.

It is clear that smaller brands are inclined to stay safe, and rely extensively on pre-established forecasts, and keep only a very minor proportion of their products as a subject to fickle trend fluctuations.

6.2.2 Sourcing

Monki does not own any factories, which is easily explained by the fact that FaBric Scandinavien primarily specialised in fashion retailing with shops that were selling a mixture of brands, none of which belonged to the parent company itself, except for Cheap Monday. This is the reason why maintaining production plants would not have been feasible. The sourcing is mainly handled by Puls Trading, which is H&M group's buying office in Hong Kong. It serves as a communication medium between Monki's office and suppliers while also taking care of all the related documentation. Monki likes to share their suppliers with other brands in the group so that factories are not dependent solely on orders from Monki. The brand opts for long-term relationships a limited number of suppliers. Some connections extend from the time when the company was started. As explained in Section 4.1.2., this is clearly very beneficial to both sides, and Monki can trust the suppliers more, and it was definitely able to establish a more efficient information flow over the extended period of collaborative work.

The range of clothes in Monki is all fashion-led and there are hardly any basics, apart from perhaps most general T-shirts in universal colours with minimum design involvement. However it does not mean that the company is not eligible to benefit from mixed supply base described in Section 4.2. In order not to depend on trendy items only and being pressured by short lead times and costs that would entail from having to send most of the products by air, Monki found the solution in its own character. Every theme would include pieces that suit the brand style even beyond intra-collection flicks, although at the same time they reflect current trends. The multi-functional nature of those secures their relatively long-term position during the complete season. This type of

apparel is produced in distant locations and is delivered by sea, while time-sensitive garments are sourced closer to home and mostly delivered by air.

6.2.3 Distribution and retailing

Monki owns its warehouse, distribution centres (DC), and stores. Clothes are shipped from suppliers to DCs using a third-party courier. This structure is not very different of that used by larger enterprises. As brands grow, however, they tend to prefer ownership of transportation fleet. The warehouse is mostly used for storing pieces destined for e-commerce. From DCs clothes are distributed to shops whose inventory usually is not replenished daily. This means that stores have to display all of the articles in repetitive sizes and keep a certain quantity of stock keeping units, but just enough to accommodate demand in a very short time span. This could have been catastrophic if Monki had an extremely wide product variety, but for its own convenience, the company tries to keep the assortment as narrow as possible without jeopardizing the service level and consequently customer satisfaction.

6.3 ICT

Given that Monki is a small firm that appeared not so long ago, it cannot splurge on expensive ICT, such as EPC/RFID tagging or ERP. Their CAD/CAM systems are fairly modest for Monki has not invested in a PLM solution so far. Designers use Adobe Illustrator for sketching. This is a stand-alone vector graphics software that, just like other CAD applications, streamlines and speeds the design process noticeably. It is not equipped with 3D visualisations, which explains the long fitting process in Monki, with samples needed to be sent back and forth several times for approval.

Likewise, the company’s ICT network is not consolidated with any ERP solution, but exemplifies legacy systems with separate modules for each type of activity linked via Extensible Markup Language (XML), a computer language which basically represents a set of syntax rules that form structured text by using tags. It is based on Unicode, a universal standard for encoding various writing systems. This language can be used regardless of an IT platform, since every computer application is able to read and display XML by processing it with other computing methods installed as a part of every

application, which describe and render markup languages. Information is being interchanged amongst partners through Internet.

Lastly, as one may guess, EPC/RFID technology is not an element of the brand's distribution and retailing process because of its high implementation cost. The method for product identification is regular bar coding (Figure 10), which means that shops are equipped with bar code scanners as a part of their PoS solution.

Figure 10. Bar code on a Monki label (first group of numbers is determined by a product model)

Since H&M group allowed newly acquired brands to retain their general liberty, Monki's information system is operated discretely; however, company's IT division is now a part of H&M's overall IT department.

7 Conclusions

In this research, the nature of FF has been explained by, firstly, identifying its position in the broader fashion market, and secondly, clarifying that even though having emerged as a development of QR, FF nonetheless has fairly distinctive traits that allow it to stand independently. These include increased product variety as compared to regular apparel brands, which is a direct result of marketing orientation of this particular business model manifested in the will to maximise profits, simplified supply chains, and embrace of international markets. Companies in this business have re-evaluated such matters as use of feedback and inventory holding.

Increased speed is exactly what drives FF industry. However, it is not the only ground for competing with rival brands, as ever-progressing environment demands compound sources for SCA, meaning that brands have to combine their time race ambitions with

cost leadership and/or other types of differentiation, e.g. product design or corporate identity. Finally, in order to succeed in pursuit of SCA, FF companies have to find a compromise between their cost and service offering. SCM was discerned as a means to effectively differentiate through delivering maximum value to the customer. Various techniques utilized by major players in the industry were described. Special attention was paid to ICT, as an integral part of FF, giving an overview of the most important tools illustrated by the latest company cases.

Clearly, SCM practices differ from company to company, but the biggest gap can be observed between those of big and small brands. That is why Monki was taken as a company case to add to shorter examples of large enterprises' SCM practices in other chapters. Monki case, thus, represents another dimension, rather than a plain case that would comprise everything described in theory; it gives a perspective of how smaller businesses try to survive in the extremely competitive environment, for no matter the size of the company or its operational volumes, it still competes on the same level with other FF brands. It has been discovered that due to their obvious lack of finances, brands like Monki cannot invest too much into physical facilities or IT, and therefore have to choose what SCM instruments are the most crucial for their personal strategy. These brands do not necessarily try to switch to lean management, but rather look for mixed tactics. There is no significant difference between the ratio of ownership/outsourcing of resources as compared to bigger companies. Neither there is much difference in their attitude to suppliers. The most important capital underpinning such small brands' operations is their defined corporate identity. Clearly, they are not inclined to assume risks in their strategies, and therefore are likely to "play safe".

In general, a solid theory base on FF's thrust has been accumulated and presented, backed up with up-to-date company cases, which has been lacking from the currently available literature on the topic. Nevertheless, it must be pointed out that the point of view adopted in this study is highly subjective and may not coincide with that of other researchers. Other limitations include the level of comprehension of FF brands' marketing strategies and consumers' perception of those. In order to eliminate those, a thorough survey may be conducted, and the results will add sociological and psychological aspects to the research.

The influence of corporate identity, combined with SCM, on competitive strategies of FF brands represents another potential area for further research. It can provide a

clearer vision of the basis that brands compete on. Deeper investigation of ICT used in FF may also be useful in adding to understanding of the subject, for technology race in this industry is one of the fiercest, and much of companies' finances are being invested in this area.

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Case Study: Questions for Monki AB

1. How many months ahead do you start preparing for a new season? What are the sources of inspiration for your designers, i.e. what are the methods of spotting new trends (fashion shows, trend forecasting reports, street styles)?

2. How many collections does your brand launch per year?

3. Do you use ERP? If yes, who is your provider and what is your solution?

4. How does the process of design and manufacturing go, i.e. what are the stages of it? How long is the generic cumulative lead time for designing, manufacturing and distributing a piece of clothing?

5. Do you use computer-aided design/computer-aided manufacturing?

6. Do you source textiles before or after an item has been designed? Do you practice postponement (for example, dyeing fabrics right before production takes place)?

7. Do you use RFID (if yes, on which stages of production/distribution)?

8. Please list your supply chain components (1st and 2nd tier suppliers, factories, warehouses, retailers)? Which ones does your company own? Do you prefer vertical integration or partnerships? Do you share resources with other brands in your parent company?

9. Where are your suppliers located, where does the manufacturing take place? Do you blend your mix so that overseas suppliers manufacture basics and the ones closer to the market focus on fashion-sensitive items? Do some stages of production take place in-house?

10. Do you differentiate between your suppliers and customers as being key and non-key? Do you request exclusivity? How do you support your suppliers (e.g.

by offering help in technology implementation)? Do you require compliance from your suppliers' side in terms of communication technology)?

11. Do you use third-party logistics (either in warehousing, transportation, or information services)? If you use warehouses, how long do items stay there? Who is responsible for transportation of goods from manufacturers to warehouses and from manufacturers to stores (or directly from factories to stores if that is the case)?

12. How often do you replenish stock in your physical shops and your web-store?

13. Do you adjust your product supply according to up-to-date point-of-sale data? Do you tend to re-order items from factories if they are sold out before season is over or is collection is produced only once?